UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,310	07/07/2003	Hagai Aronowitz	42P16791	1859

8791 7590 02/27/2007 BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030	**EXAMINER** JACKSON, JAKIEDA R

ART UNIT	PAPER NUMBER
2626	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   **Claim 1-4, 7-10, 14-20, 24-33, 37-40, 43-46 and 50-56** are rejected under 35

U.S.C. 102(e) as being anticipated by Wolf et al. (PGPUB 2003/0204399), hereinafter

referenced as Wolf.

Regarding **claims 1 and 37**, Wolf discloses a method, system and article,

hereinafter referenced as a method for processing a speech signal, comprising:

receiving an input speech signal (spoken queries; column 1, paragraph 0013);

constructing a phoneme lattice for the input speech signal (lattice; column 2,

paragraph 0020 with column 4, paragraph 0055);

searching the phoneme lattice to produce a likelihood score for each potential

path (likelihood of paths; column 3, paragraph 0038); and

determining a processing result for the input speech signal based on the

likelihood score of each potential path (likelihood scores of path; column 3, paragraphs

0033-0040).

Regarding **claims 2, 8, 16, 30, 38, 44 and 52**, Wolf discloses a method wherein constructing the phoneme lattice comprises:

segmenting an input speech signal into frames (word-level lattices; column 2, paragraph 0020 with column 3, paragraphs 0033-0040);

extracting acoustic features for a frame of the input speech signal (acoustic information; column 2, paragraphs 0022-0023 with column 1, paragraph 0013);

determining K-best initial phoneme paths leading to the frame based on a first score of each potential phoneme path leading to the frame (best scoring path; column 3, paragraphs 0033-0040); and

calculating a second score for each of the K-best phoneme paths for the frame (confidence scores; column 2, paragraph 0021 with column 3, paragraphs 0033-0040).

Regarding **claims 3, 9, 17, 39, 45 and 53**, Wolf discloses a method further comprising:

clustering together K-best initial phoneme paths for at least one consecutive frame (single best scoring path; column 3, paragraphs 0033-0040);

selecting M-best refined phoneme paths among the clustered phoneme paths based on second scores of these paths (best scoring path; column 3, paragraphs 0033-0040); and

identifying vertices and arc parameters of the phoneme lattice for the input speech signal (inherent in figures 3a and 3b with column 3, paragraphs 0033-0040).

Regarding **claims 4, 10, 18, 26, 40, 46 and 54**, Wolf discloses a method wherein the first score and the second score comprise a score based on phoneme acoustic

models and language models (model; column 2, paragraph 0024 with column 4,

paragraphs 0051-0055).

Regarding **claims 7 and 43**, Wolf discloses a method wherein determining the

processing result comprises determining at least one of the following: at least one

candidate textual representation of the input speech signal and a likelihood that the

input speech signal contains targeted keywords (text transcript; column 1, paragraph

0006).

Regarding **claims 14 and 50**, Wolf discloses a method further comprising

determining a search result for the input audio signal based on the modified score of

each searched path (dividing the scores; column 3, paragraphs 0033-0040).

Regarding **claims 15, 31-33 and 51**, Wolf discloses a method for distributing

speech processing, comprising:

receiving an input speech signal by a client (spoken query; column 3, paragraphs

0033-0040);

constructing a phoneme lattice for the input speech signal by the client (lattice;

column 3, paragraphs 0033-0040);

transmitting the phoneme lattice from the client to a server (column 3,

paragraphs 0033-0040); and

searching the phoneme lattice to produce a result for the input speech signal for

the purpose of at least one of recognizing speech and spotting keywords, in the input

speech signal (speech recognition; column 3, paragraphs 0033-0040).

Regarding **claims 19 and 55**, they are interpreted and rejected for the same reasons as set forth in claim 5. In addition, Wolf discloses a method wherein searching the phoneme lattice comprises:

determining a search result for the input audio signal based on the modified score of each searched path (dividing the scores; column 3, paragraphs 0033-0040).

Regarding **claims 20 and 56**, Wolf discloses a method wherein modifying the score comprises adjusting the score by at least one of the following: allowing repetition of phonemes and allowing flexible endpoints for phonemes in a path (expanded to their most frequent; column 4, paragraphs 0047-0049).

Regarding **claims 24**, it is interpreted and rejected for the same reason as set forth in claim 15. In addition, Wolf discloses a speech processing system comprising:

a plurality of models for lattice construction (column 3, paragraphs 0033-0040 and column 4, paragraph 0055); and

a plurality of models for lattice search (column 3, paragraphs 0033-0040 and column 4, paragraph 0055).

Regarding **claims 25 and 28**, they are interpreted and rejected for the same reasons as set forth in the combination of claims 2-3.

Regarding **claim 27**, it is interpreted and rejected for the same reasons as set forth in the combination of claims 21 and 24.

Regarding **claim 29**, Wolf discloses a system wherein the phoneme path estimator comprises a likelihood score evaluator to calculate a first score for a potential

phoneme path leading to each frame (likelihood of scores; column 3, paragraphs 0033-0040).

3.   **Claims 21-23, 34-36 and 57-59** are rejected under 35 U.S.C. 102(e) as being anticipated by Van Thong et al. (USPN 6,985,861), hereinafter referenced as van Thong.

Regarding **claims 21, 36 and 57**, Van Thong disclose a method for training a phoneme confusion matrix, comprising:

initializing the phoneme confusion matrix (phoneme confusion matrix; column 7, lines 33-62);

estimating confusion probabilities between phonemes based on a training database, and the initial phoneme confusion matrix (column 7, lines 33-62); and

updating the phoneme confusion matrix based on the estimated confusion probabilities (column 7, lines 33-50).

Regarding **claims 22 and 58**, Van Thong discloses a method wherein the training database comprises a plurality of utterances, actual phoneme sequences corresponding to the plurality of utterances, and time alignment information between utterances (column 7, lines 11-32) and actual phoneme sequences of the utterances (column 6, lines 7-22).

Regarding **claims 23, 35 and 59**, Van Thong discloses a method wherein estimating the confusion probabilities comprises:

constructing a phoneme lattice for each utterance in the training database

(lattice; column 11, lines 3-17);

searching the phoneme lattice to produce a phoneme sequence hypothesis for

the corresponding utterance (lattice; column 11, lines 3-17); and

estimating the confusion probabilities between phonemes based on statistics

obtained by comparing actual phoneme sequences and corresponding phoneme

sequence hypotheses (column 7, lines 33-62).

Regarding **claim 34**, it is interpreted and rejected for the same reasons as set

forth in claims 21 and 23.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.   **Claims 5-6, 11-13, 41-42 and 47-49** are rejected under 35 U.S.C. 103(a) as

being unpatentable over Wolf in view of Van Thong.

Regarding **claims 5, 11-12, 41, 47 and 48**, Wolf discloses a method wherein

searching the phoneme lattice comprises:

receiving a phoneme lattice (column 4, paragraph 0055);

traversing the phoneme lattice via potential paths (column 3, paragraphs 0033-0040); and

modifying the score for the traversed path (column 3, paragraphs 0033-0040), but does not specifically teach computing a score for a traversed path based on at least one of a phoneme confusion matrix and a plurality of language models.

Van Thong teaches a method comprising teach computing a score for a traversed path based on at least one of a phoneme confusion matrix (column 7, lines 33-62) and a plurality of language models (column 1, lines 29-36), to compute the N-best lists.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wolf's method wherein it comprises computing a score for a traversed path based on at least one of a phoneme confusion matrix and a plurality of language models, as taught by Van Thong, to store the likelihood of confusion pairs of phonemes (column 7, lines 33-62) and to obtain the N-best lists (column 1, lines 29-36),

Regarding **claims 6, 13, 42 and 49**, Wolf discloses a method wherein modifying the score comprises adjusting the score by at least one of the following: allowing repetition of phonemes and allowing flexible endpoints for phonemes in a path (expanded to their most frequent; column 4, paragraphs 0047-0049).

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Nguyen et al. (USPN 5,995,928) disclose a method and apparatus for continuous spelling speech recognition with early identification.

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R. Jackson whose telephone number is 571.272.7619. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571.272.7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JRJ
February 20, 2007

DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600